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"..... per litora spargite muscum,
Naiades, et circum vitreos considite fontes:
Pollice virgineo teneros hic carpite flores:
Floribus et pictum, divæ, replete canistrum.
At vos, o Nymphæ Craterides, ite sub undas;
Ite, recurvato variata corallia trunco
Vellite muscosis e rupibus, et mihi conchas
Ferte, Deæ pelagi, et pingui conchyliis succo."
N. Parthenii Giannettasi, Eol. 1

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I.—*Descriptions of Twenty-nine Species of Marine Mollusca from the Persian Gulf, Gulf of Oman, and North Arabian Sea, mostly collected by Mr. F. W. Townsend, of the Indo-European Telegraph Service.* By JAMES COSMO MELVILL, M.A., D.Sc., F.L.S.

[Plates I. & II.]

THREE years have elapsed since the last paper was published treating of the Molluscan Fauna of the Persian Gulf and its dependencies. Since that time, mainly in 1907, Mr. Townsend forwarded some fresh consignments, for the most part consisting of dredged material from the neighbourhood of

- (a) Karachi,
- (b) Charbar,
- (c) Astola Island,
- (d) Henjam I.,
- (e) Bahrein Is.,
- (f) Bunder Abbas,
- (g) Bushire,
- (h) Bombay,

and it has taken a long time—indeed, the task is not yet
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finished—to properly examine these gatherings, a fact which is not surprising when the microscopic size of the bulk of the material is considered.

As is almost invariably the case in deep-sea products, the predominating molluscan families are Pleurotomidæ, first in point of numbers, followed by Pyramidellidæ, Trochidæ, Rissoidæ, and Cerithidæ.

In the following descriptive paper I have eliminated all members of the second family named—Pyramidellidæ,—as I have prepared, separately, a revision of the Gulf species, which I hope may be published this autumn; but examples of the remaining and other families will be found among the twenty-nine species now to be enumerated.

The time does not seem to have arrived for a new edition of the 'Catalogue of Gastropoda and Scaphopoda' published in 1901, though a considerable number of species could now be added, and several emendations would likewise have to be made at the same time.

Including the Pelecypoda, the catalogue of which was published only three years ago, the number of Mollusca enumerated from these seas amounts to over 1700 species, and of these it has been found necessary to describe more than a third as new to science.

Acknowledgments are due to Mr. G. B. Sowerby, Mr. E. R. Sykes, Mr. J. R. le Brockton Tomlin, and Mr. Edgar Smith, I.S.O., while our sense of indebtedness to Mr. F. W. Townsend has been, if possible, still further accentuated and enhanced by the fresh services he has rendered to the science of malacology during the past two years.

Cyclostrema tredecimlineatum, sp. n. (Pl. I. fig. 1.)

C. testa depresso-discoidali, minuta, alba, delicata, late umbilicata; anfractibus 4, quorum $1\frac{1}{2}$ apicales mamillati, læves, nitidi, cæteris ad suturas leniter quasi-canaliculatis, penultimo spiraliter 3-, ultimo 13-lineato—supra sex, infra septem lineis prædito,—liris indistinctis, hic illic fortioribus; apertura obliqua, peristomate rotundo, continuo.

Alt. 1, diam. 2 mm.

Hab. Gulf of Oman, lat. $26^{\circ} 6' N.$, long. $50^{\circ} 58' E.$, 15 fathoms.

A rare and delicate species, white, discoidally depressed, with large umbilicus, four-whorled, two being apical, mammillate, the remainder ornamented with fine, somewhat indistinct and unequal spiral lines, thirteen in all upon the body-whorl, six being on the upper side, and seven basal, round the umbilicus. The periphery is not conspicuously angled.

Cyclostrema (Tubiola) nugatorium, sp. n. (Pl. I. fig. 2.)

C. testa depressa, profunde umbilicata, tenuissima, lactea; anfractibus 4, quorum apicales 2 apice ipso bulboso, vitreo, cæteris ad suturas obtuse canaliculatis, lævissimis, lineis incrementalibus sub lente longitudinaliter tenuissimis præditis, apud peripheriam rotunde depressa, basi lævi: apertura rotunda, peristomate tenui, fere continuo.

Alt. .50, long. 1.75 mm.

Hab. Mekran Coast, Charbar, 40 fathoms.

Minute, but interesting. The little shell is milky white, smooth, and delicate, the incremental lines of growth being but barely distinguishable with a considerable power. The umbilicus is particularly wide and deep, and the shell itself almost a replica, but in miniature, of *Tubiola nivea*, Ch., from Japan.

Solariella iridifulgens, sp. n. (Pl. I. fig. 3.)

S. testa conica, umbilicata, lævissima, pulchre iridescente, tenuissima, perfragili, nitida, albo-cinerea, flammis rufis depicta; anfractibus 5, quorum apicales 2 albi, stramineo—vel puniceo-tingenti, spiraliter tenuilirati, cæteris tribus infra suturas deplanatis, perlævibus, ventricosulis, ultimo rapide accrescente, ad peripheriam rotundato, circa umbilicum spiraliter tornato et striatulo, umbilico ipso profundo; apertura rotunda, labro tenui, columella simplice.

Alt. 4, diam. 6 mm.

Hab. Mekran Coast; off Charbar, at 40 fathoms; off Astola Island, 90 fathoms; Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms, shell-sand.

A very fragile shell, brilliantly nacreous, green, violet, and blue iris hues mostly occurring, often collected in battered condition, the somewhat fugitive outer cuticle, showing rufous flames depicted upon a greyish ground, soon wearing away. The finest examples occurred off Charbar; it was both rare and in poor condition, and small, in the famous Gulf of Oman dredging at 156 fathoms.

Monileu chiliarches *, sp. n. (Pl. I. fig. 4.)

M. testa anguste umbilicata, turbinata, pallide albo-straminea, intus fulgide margaritacea, delicata; anfractibus 5, quorum apicalis vitreus, bulbosus, cæteris pulchro gradatis et tornatis, tribus supernis (præcipue penultimo) infra suturas radiatim sculpturatis, duabus carinis marginatis præditis, in medio, simul ac infra et supra, penultimo anfractu longitudinaliter oblique et arcissime

* χαλιάρχης, ruler of a thousand.

fenestrato, ultimo bicarinato, infra suturas radiatim oblique decorato, carinis marginatis, apud basin spiraliter quinque-lirato, liris circa umbilicium fenestratis longitudinaliter incrassatulis; apertura rotunda, intus pulchre iridescente, peristomate tenui.
 Long. 5, lat. 8 mm.

Hab. Persian Gulf.

A unique and most beautiful species. From the figure and description, so near does it appear to *Monilea tropicalis*, Hedley *, from Mast Head Reef, Queensland, that I place it in the same genus; otherwise I had considered it, perhaps, an *Eumargarita*, P. Fischer. Some authors, doubtless, would include it in *Solariella*, S. Wood, but this last is but sub-generic to *Monilea*, in my opinion.

Epitonium schepmani, sp. n. (Pl. I. fig. 6.)

E. testa late ovata, delicata, alba, vel albo-cinerea, imperforata; anfractibus 9, quorum apicales tres bicolores, nitidissimi, perlæves, cæteris ventricosis, apud suturas impressis, longitudinaliter undique lamellosis, lamellis hic illic varicosis, tenuibus, lævibus, fragilibus, anfractibus supernis arctissime lamellatis, anfractu ultimo bi- vel trivariicoso, lamellis ad 36, interstitiis inter lamellas spiraliter delicato-striatis; apertura rotunda, peristomate continuo, margine columellari incrassato.
 Long. 9, lat. 4.50 mm.

Hab. Sheikh-Shuaib I., Persian Gulf.

Distinguished by its thin, shining, smooth lamellæ, which are so crowded in the two or three whorls just below the nuclear as almost to impinge upon each other. They number thirty-six upon the body-whorl, of these two or three are variced. It does not seem very akin to any of the *Scalarie* known from the Persian Gulf region. I have much pleasure in dedicating this interesting species to Dr. M. M. Schepman, whose monograph on the Gastropodous Mollusca of the 'Siboga' expedition is memorable.

Epitonium zatrefhes, sp. n. (Pl. I. fig. 5.)

E. testa oblonga, imperforata, delicata, albida; anfractibus 9, quorum tres apicales læves, nitidi, cæteris ventricosis, apud suturas impressis, lamellis tenuibus ornatis, numero anfractum ad ultimum circa 20, anfractibus supernis arctissime lamellatis, interstitiis inter lamellas pulchre et arcte striatis; apertura fere rotunda, peristomate continuo, columella paulum excavata.
 Long. 9, lat. 4 mm.

Hab. Mekran Coast; off Charbar.

* Proc. Linn. Soc. N.S.W. 1907, vol. xxxii, p. 490, pl. xvi. fig. 12.

Of the same dimensions as the last species just described, but there are no traces of varices; the characters, likewise, of the lamellæ are different, these being clearly cut, smooth, and thicker than in the fellow species. The spiral striæ are also much more fine and delicate.

There seems now no hope that the names *Scalaria* or *Scala*, which have graced this genus with such aptitude during so many years, can be preserved, unless, indeed, some of the more inexorable decrees of the law of priority be removed. Since Bolten's names are to be recognized, it will be well to ask why he called the "Wentletraps" by the harsh-sounding *Epitonium*. The name might be worse however: it is pure Greek, ἐπιτόνιον signifying the "key by which the strings of an instrument are tightened to tune it"; presumably, therefore, the chord-like close longitudinal lamellæ, tightly packed over the whorls, suggested it.

Crosseia alliciens *, sp. n. (Pl. I. fig. 7.)

C. testa minima, anguste umbilicata, rotundo-conica, pellucida, albo-vitrea, nitida, tenuissima; anfractibus 4, apicali parvo, cæteris apud suturas impressis, ventricosulis, lævissimis, ultimo globoso, circa umbilicum concentricè fortiter exsculpto et marginato, umbilico ipso parvo; apertura ovato-rotunda, peristomate tenui, collumella excavatula.

Alt. 1·75, diam. 1·30 mm.

Hab. Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms, shell-sand.

Very minute and papyraceous; perhaps, indeed, not quite adult, but the distinguishing features of the species are all present—the umbilical ridge, for instance, is strongly built and conspicuous. The umbilicus itself is small and narrow; whorls four, ventricose. Substance of shell glassy, thin, quite smooth throughout, and polished. The only other species yet known from the same seas is *C. eryma*, Melv. † This, though equally small, is a stouter shell, solid, and spirally closely striate throughout. But few possess no sculpture; such, however, is the case with *C. naticoides*, Hedley ‡, and one or two other Australian species, including also *C. glabella*, Murdoch §, from New Zealand, and *carinata*, Hedley ||, from Port Kemble ('Thetis' Expedition), a very minute species, alt. 1·7, diam. 1·46 mm., with a blunt peripheral keel.

* *Alliciens*, alluring.

† Proc. Mal. Soc. Lond. vii. (1906) p. 70, pl. vii. fig. 7.

‡ Rec. Australian Mus. vi. (1907) p. 290, pl. liv. figs. 6, 7.

§ Trans. N.Z. Inst. xxxvii. (1905) p. 225, pl. viii. figs. 16, 17.

|| Mein. Austral. Mus. iv. p. 345, fig. 71 (1903).

*Teinostoma emm-les**, sp. n. (Pl. I. fig. 8.)

T. testa subrotunda, profunde et late umbilicata, solida, calcarea, alba; anfractibus ad 5, quorum $2\frac{1}{2}$ apicales bulbosi, lactei, læves, cæteris acutissime spiraliter liratis, liris sub lente irregulariter rugatis, inter-titiis foveolatis, ad suturas valide impressis. ultimo rotundato, lineis incrementalibus longitudinaliter accinctis, liris apud basin circa umbilicum distantibus; apertura obliqua, semi-lunata, peristomate subincrassato, paullum effuso, margine columellari recto, callo linguifero umbilicum obtegente.

Alt. 6, diam. 5 mm.

Hab. Persian Gulf; Henjam Island, 1906.

A most interesting species, of doubtful place and affinities. After much consideration, I began by calling it a *Cyclostrema*, but it might, owing to the obliquity of mouth, be equally thought an *Adeorbis*, while the general "facies" suggests *Eunaticina*. There are several points of agreement with *Teinostoma parvulum*, Hedley, judging from figure and description, more especially as regards the close spiral lira uniformly covering the whole surface, and also the prolongation of the tongue-shaped varix over the umbilicus. This causes me to consider it of the same genus.

Ethalia diotrephe†, sp. n. (Pl. I. fig. 9.)

E. testa parva, alba, profunde umbilicata, solidula; anfractibus 4, quorum apicales $1\frac{1}{2}$ perlæves, bulbosi, cæteris supra peripheriam omnino fere planulatis, delicatissime undique spiraliter liratis, lirulis acutis, sub lente punctulosis, oblique radiatim decurvatis, extus marginulatis, peripheria acute carinata, subtus lirulis similiter acute punctulosis, circa umbilicum radiatim extensis; apertura rotunda, labro extus paullum incrassato, subangulato, continuo, columella late et triangulatim supra umbilicum extensa et lingulata.

Alt. 2, diam. 3.20 mm. (sp. maj.).

Hab. Gulf of Oman, lat. $24^{\circ} 58' N.$, long. $56^{\circ} 54' E.$, 150 fathoms in shell-sand.

Unfortunately both the examples that have occurred of this strange species are broken; the larger especially so in the region of the mouth, the smaller, however, showing these portions more perfectly. I know no shell at all comparable; and had hoped, before attempting to describe it, that some perfect specimens would be found, but this now seems very unlikely to be the case. It is small, of thickish substance,

* ἑμιέλης, harmonious.

† εἰστέρεφης, noble.

white, four-whorled, $1\frac{1}{2}$ being apical, bulbous; the umbilicus is straight-walled, deep, solaroid, but the margin, as also in *Fluxina*, is not crenulate; the surface above is closely concentrically shagreened and dotted, the periphery acutely keeled, upper whorls very slightly depressedly conical. Below, though imperfect, signs of a lingulate columellar callus can be discerned which would partially cover the umbilicus. This shell is now placed in *Ethalia* only tentatively; and I have, since description, found an imperfect, but beautifully sculptured specimen of probably the same species in shell-sand from Port Darwin, N. Australia, received from Dr. J. C. Cox.

Fluxina stenomphala *, sp. n. (Pl. I. fig. 10.)

F. testa parva, anguste umbilicata, vitrea, lactea, magnopere delicata. depresso conica, ad peripheriam acutissime cariuulata; anfractibus 5, apicalibus duobus inclusis, ventricosulis, vitreis, lævibus, cæteris ad suturas canaliculatis, tornatis, supra suturas marginatis, ultimo anfractu circa peripheriam pulcherrime denticulato, apud basin lævi, circa umbilicum angustum radiato, marginato; apertura angusta, labro tenuissimo, margine columellari apud umbilicum paullulum reflexo.

Alt. 1.50, diam. 3.25 mm.

Hab. Gulf of Oman, lat. $25^{\circ} 10'$ N., long. $61^{\circ} 34'$ E.; Mekran Coast; Charbar, 40 fathoms.

This is the second *Fluxina* obtained from the Persian Gulf region: the first, a smaller species, was described under the name of *F. dalliana* †, Melv. & St., in 1903.

There have been lately introduced by Dr. Schepman two beautiful small species, dredged during the 'Siboga' expedition, *Fl. marginata* and *trochiformis*, Schep., and the latter of these has some affinity to our shell, from which, indeed, it differs in size and in the much narrower umbilicus. From this circumstance the trivial name is proposed. We may add, the beautifully denticulate margin is the same in both species, as is the general form and sculpture. It has only occurred, so far, very rarely in shell-sand.

Rissoa (Apicularia) townsendi, sp. n. (Pl. I. fig. 11.)

R. testa parva, inflata, tenuissima, alba, fragili, subrotunda; anfractibus ad 5, quorum duo apicales perlæves, albi, cæteris gradatulis, ad suturas multum impressis, ventricosis, nitidis, longitudinaliter peroblique costulatis, costis indistinctis, superficialibus, apud

* στενόμφαλος, with narrow umbilicus.

† Ann. & Mag. N. H. ser. 7, vol. xii. p. 298, pl. xxi. fig. 2 (1903).

basin omnino evanidis, undique spiraliter striatulis; apertura rotunda, peristomate tenui, continuo, columella paullum excavata. Long. 2·75, lat. 1·75 mm.

Hab. Karachi, 1906; Gulf of Oman, lat. 24° 58' N., long. 56° 54' E., 156 fathoms, shell-sand.

An inflated, gradately-whorled *Rissoa* of great tenuity, being evidently an abyssal species. It differs from *R. charope* altogether in sculpture, and also from *R. versoverana*, both these being inhabitants of the same seas. This last is a much more solidly constructed shell, more compact, of brown colour, or white flecked with brown, two forms occurring, one of which, owing to its obese body-whorl, the more approximates *R. townsendi*.

Rissoa (Scrobs) elspethæ, sp. n. (Pl. I. fig. 12.)

R. testa cylindrica, semipellucida, delicata, tenui; anfractibus 5-6, quorum apicales tumidi, ad apicem ipsum deplanati, dein bulbosi, cæteris 3½ ad suturas impressis, ventricosis, lævibus, ultimo prolongato, paullum obliquo; apertura ovata, peristomate continuo, columella obliqua.

Long. 3, lat. 1 mm.

Hab. Mekran Coast; Charbar, 40 fathoms.

A very beautiful and delicate, though minute species, and in local abundance at the above dredging, though we have not yet discerned it from elsewhere. It is of the same form but smaller than *R. (Scrobs) columen**, Melv., from the Gulf of Oman at 150 fathoms, and it is likewise quite smooth, the larger species being uniformly spirally striate. I have pleasure in connecting with this the Christian name of my niece Mrs. Reginald Fletcher, who has always evinced great interest in biological studies.

Rissoa (Scrobs) ictriella, sp. n. (Pl. I. fig. 13.)

R. testa attenuata, oblonga, parum nitida, pallide lirescente, tenui; anfractibus 6, quorum apicales duo, quorum apex ipse planatus, simplex, cæteris ventricosis, apud suturas impressis, undique sub lente delicatissime et obscure spiraliter striolatis, ultimo anfractu paullum prolongato; apertura ovata, labro tenui, continuo, columella fere recta.

Long. 4·75, lat. 1·50 mm.

Hab. Karachi, 1906.

A single specimen, but in my opinion possessing characters that merit differentiation. The shell is of a livid colour,

* Proc. Mal. Soc. Lond. vi. p. 53, pl. v. fig. 21 (1904).

smooth, not shining, microscopically delicately spirally striolate, with flattened nuclear whorls and apex, the remaining whorls decidedly ventricose. Body-whorl to some extent prolonged, mouth ovate; peristome continuous, slightly thickened.

Obortio elongella, sp. n. (Pl. I. fig. 14.)

O. testa anguste oblonga, parva, alba, delicata; anfractibus 10, quorum 3 apicales, apice ipso parvo, rufo, lævi, deinde duobus rufo-tinctis, cæteris albis, apud suturas impressis, multum ventricosis, longitudinaliter, simul ac spiraliter, decussatim rugulosoliratis; apertura ovata, peristomato tenui, fere continuo, columella paulum excavata.

Long. 4, lat. 1.25 mm.

Hab. Mekran Coast, off Charbar.

A small elongate shell, narrower but of the same calibre as *Styliferina fulva**, Wats., which is placed by Mr. C. Hedley in his genus *Obortio*†, in company with *Rissoa pyrhaeme*‡, M. & St., and the lately described *O. vulnerata*, Hedley§. It comes nearest to *O. fulva*, but is much the same size and contour as *O. vulnerata*.

The type of this genus was described by myself in collaboration with Mr. Standen, as has just been observed, as a *Rissoa*, and subsequently tentatively considered an *Alaba*||. Later both Hedley and Dall¶ placed it among the Pyramidellidæ, but the former author, finding the nuclear whorls non-heterostrophe, has again transferred it to the Rissoidæ.

This interesting species (*O. pyrhaeme*) I now have in my collection from Mauritius (*W. Moss*), from the Persian Gulf (*Townsend*), and Bombay (*Abercrombie*), likewise from Bydong Cays (*Haddon*), and Thursday Island, Torres Straits (*A. K. Henn*); and it appears to me not to vary at all, excepting a degree in size, from any of these places and to be quite distinct from *O. fulva* (Wats.), with which some authors are inclined to associate it.

* Rep. 'Challenger' Exped. xv. p. 571, pl. xlii. fig. 5 (1886).

† Hedley, Moll. of Funafuti, Mem. Austral. Mus. iii. p. 412, fig. 6 (1899).

‡ Journ. Conch. viii. 1896, p. 310, pl. xi. fig. 70.

§ Proc. Linn. Soc. N.S.W. 1909, xxxiv. p. 439, pl. xl. fig. 52.

|| Journ. Linn. Soc. Lond., Zool. xxvii. p. 170 (1899).

¶ Dall & Bartsch, Mon. W. Am. Pyramidellid Mollusks, p. 16 (1909).

Cerithium trigonostomum, sp. n. (Pl. I. fig. 15.)

C. testa parva, regulari, fusiformi, pallide ochracea vel alba; anfractibus 11, quorum apicalis perminutus, lævis, cæteris ad suturas impressis, regulariter costulatis, costis utrinque gemmulatis, ad medium spiraliter uniliratis, superficie rugosa, ultimo anfractu multilirato, præcipue ad basin, et bino gemmularum ordine ad costas infra peripheriam decorato; apertura subtrigona, labro recte effuso, obtusangulo, breviter ad basin rostrato.
Long. 6·75, lat. 2 mm.

Hab. Mekran Coast, Charbar, 40 fathoms.

A few examples only of a neat little *Cerithium*, with regularly chased whorls, there being two rows of beading on the riblets on either side of the sutures, a strong median lira dividing them. The body-whorl is well furnished with liræ below the periphery to the base. Mouth subtrigonal, outer lip somewhat angled and prominent, shortly beaked basally.

Cerithiopsis eutreta *, sp. n. (Pl. II. fig. 16.)

C. testa minuta, attenuato-cylindrica, tenui, ochro-cinerea; anfractibus ad 10, quorum apicales 3 ochracei, læves, cæteris ventricosulis, ad suturas impressis, ad medium spiraliter tribus carinulis decoratis, ultimo quatuor, infra et supra, juxta suturas, spatio intervallari præditis. quod, cum interstitiis inter carinas spirales, minute foveolatum et alveatum est; apertura ovata, labro paullum effuso, tenui, columella excavata, canali producto.
Long. 3, lat. 1 mm.

Hab. Persian Gulf, Henjam Island.

With *C. henjamensis* one specimen only of a distinct little shell occurred, its sculpture being peculiar. Ten-whorled, the three apical being smooth, the remainder thrice spirally keeled, these keels being approximate to each other; on either side between them and the sutures the surface is plain but much pitted and honeycombed; the same alveate condition obtains between the spiral keels, of which the body-whorl possesses four, with curtly angled base, and plain; the mouth oval, columella slightly excavate.

Cerithiopsis henjamensis, sp. n. (Pl. II. fig. 17.)

C. testa parva, angusta, attenuato-cylindrica, læte ochraceo-brunnea, solidula; anfractibus ad 13, quorum apicales 3 lævissimi, vitrei, ochracei, cæteris ad suturas haud multum impressis, triplici gemmarum spirali serie arcte præditis; anfractu ultimo

* εὐρητος, honeycombed.

quatuor similibus ordinibus decorato, apud basin angulato-planato, decurtato; apertura parva, labro tenui, columella paullum excavata, canali brevi.

Long. 5, lat. 1 mm.

Hab. Persian Gulf, off Henjam Island.

A very narrow aciculate species, quite distinct from the Bombay *C. sykesii*, Melv.*, with which, from the figure, it might easily be confounded. That is a much broader shell in proportion, and coarser in its substance and sculpture.

Three examples only, the most perfect being selected for the type.

Cerithiopsis (Seila) ochrolivens, sp. n. (Pl. II. fig. 18.)

C. testa attenuata, anguste cylindrica, solida; anfractibus ad 12, apicalibus?, omnino spiraliter carinatis, supernis tribus, anfractu ultimo quatuor carinulis, quorum duobus naturalibus utrinque lividis, carina centrali ochraceo-tincta. ad basin curta, planata; apertura ovata, margine columellari calloso.

Long. 7, lat. 2 mm.

Hab. Karachi, 1906.

A small *Seila*, conspicuous for its ochraceous and grey colouring alternating spirally on the whorls, the spiral keels on either side of the sutures being livid, while that in the centre is ochraceous. Upon the body-whorl the two inner of the four spirals are of that hue, the outer being livid. The base is curtly flattened and deplanate, with the columellar margin very callous.

The only example of this distinct form is imperfect, and the nuclear details are therefore wanting.

Columbella (Seminella) salutaris, sp. n. (Pl. II. fig. 19.)

C. testa breviter fusiformi, nitida, parva, lævi, alba, vel stramineo-zonata; anfractibus sex, apicali parvo, cæteris gradatulis, ad suturas multum impressis, leniter lævicostulatis, superne, infra suturas, incrassatis, ultimo anfractu lævicostulato, vel, ut sæpe, costis evanidis, lævigato, ad basin spiraliter striato; apertura anguste flexuosa, labro intus denticulato, crassiusculo, columella ad medium recta, deinde curvata, canali brevi.

Long. 2.75, lat. 1.20 mm.

Hab. Bombay (*Abercrombie and Townsend*).

This is another species carved out of the miscellaneous

* Proc. Mal. Soc. Lond. ii. p. 109. pl. viii. fig. 8 (1896).

assemblage, now known as *C. (Seminella) selasphora, melitoma, phaula, &c.*, which were by a past generation considered all one species—*atomella*, Daclos. The true *atomella* is not, I believe, present in these waters, and is most probably entirely confined to the New World. No form of *atrata*, Gould, seems to coincide with *C. salutaris*.

Mitra (Pusia) geoffreyana, sp. n. (Pl. II. fig. 20.)

M. testa parva, utrinque attenuata, breviter fusiformi, alba; anfractibus 6, quorum duo apicales bulbosi, læves, cæteris gradatulis, longitudinaliter lævicostatis, interstitiis intercostalibus etiam fere lævibus, sub lente delicatissime spiraliter striatulis, superficie hic illic sparsim brunneo vel ochro-maculata, præcipue infra suturas ad costas, simul ac labro; apertura anguste oblonga, labro tenui, columella quadriplicata.

Long. 4.50, lat. 2 mm.

Hab. Persian Gulf, off Sheikh-Shuaib Island.

Hitherto confused with *M. blanfordi**, M. & St., to which it bears only a very distant resemblance, this pretty little species is well differentiated by its four columellar plaits, all of equal size and similar convolution. The ochre-brown spotting on an otherwise pure white ground, principally at the point of junction of the outer lip with the body-whorl and on the summit of every third rib just below the sutures on the penultimate and body-whorls, is peculiar. The same kind of scattered blotches of colour occurs in *Elusa brunneo-maculata*, Melv. †, from the same region, but is of rare occurrence among Mollusca so far as my experience goes. The whorls are extremely gradate, costæ smooth; interstices apparently likewise smooth, but with a powerful lens most delicate spiral striation is observable. With age, however, these striæ wear off.

Terebra remanulva ‡, sp. n. (Pl. II. fig. 21.)

T. testa angusta, attenuata, albo-gilva, vel, in uno specimine, lilacino-tincta; anfractibus ad 15, quorum apicales 3 nitidissimi, perlæves, brunnei, cæteris ad suturas impressis, infra, juxta suturas, spiraliter unisulcatis, undique longitudinaliter crassico-stulatis, costulis nitidis, rectis, interstitiis sub lente pulchre transversim striatis, ultimo anfractu ad medium albo-tæniato;

* Proc. Zool. Soc. Lond. 1901, ii. p. 423, pl. xxiii. fig. 19.

† Mem. Manch. Soc. vol. xli. (1897) no. 7, p. 13, pl. vi. fig. 5.

‡ *Remano, alvus*, refluxent.

apertura oblonga, brunnescente, labro tenui, columella fere recta, canali brevi.

Long. 31, lat. 7 mm. (spec. maj.).

Hab. Persian Gulf, Bundo Abbas, and Bushire, 1906.

Allied to *T. spectabilis*, Hinds, *gouldi*, Desh., and *edgarii*, Melv. It differs from these by the very delicate interstitial transverse striolations, the narrowed somewhat straight aperture, and want of ventricosity of whorl. *T. edgarii* occurs in the same seas, and it is sometimes hard to differentiate them. I am grateful to Mr. Edgar Smith for his opinion as to their distinctness.

Mangilia ichthys *, sp. n. (Pl. II. fig. 22.)

M. testa parva, fusiformi, delicata, albo-cinerea; anfractibus 7, apicalibus tribus inclusis, quorum duo superiores bulbosi, albo-lutei, læves, tertio pulchre et minute crenulato, cæteris quatuor sex-costatis, costis latis, continuis, expansis, omnibus ventricosis, ad suturas impressis, undique pulcherrime et arcissime spiraliter tenuistriatis; apertura oblonga, labro extus perlato, sinu lato, brevi, columella fere recta, basi haud producta.

Long. 7, lat. 3 mm. (spec. maj.).

Hab. Mekran Coast, off Astola Island, 90 fathoms.

A very choice though small species, and rarely occurring in shell-sand. The examples are dead, and the coloration is therefore a matter of guesswork; it is very probably pale ashy brown in life. The ribs, six in number on each of the four lowest whorls, are continuous with each other, broadened, the upper whorls being semivitreous, the third crenulate.

The only ally we can find is *M. calcata* †, Hedley, an equally rare species, only occurring, so far as is known, at Hope Island, Queensland. It differs in several ways, particularly in the sinus, which is not "an almost closed tube at top of a bold varix," as in *M. calcata*, but broad, short, and shallow, and not extending far towards the margin of the outer lip.

Mangilia querna †, sp. n. (Pl. II. fig. 23.)

M. testa parva, breviter fusiformi, pallide gilva vel straminea, solidula; anfractibus 7, quorum duo apicales tumidi, læves, cæteris

* *ἰχθυσ*, a fish, from the fish-like ribs.

† Proc. Linn. Soc. N.S.W. 1909, vol. xxxiv. pt. 3, pl. xlv. fig. 90.

‡ *Quernus*, oaken, from the colour.

apud suturas impressis, ventricosulis, perlævibus, undique longitudinaliter paucicostatis, costis crassis, nitidis, apud ultimum novem; apertura parva, ovata, labro extus crasso, nitido, ad basin truncatulo, sinu nullo, columella recta, canali brevi.

Long. 5.50, lat. 2 mm.

Hab. Mekran Coast, off Charbar, at 40 fathoms, 1900.

A thickened pale brown or straw-coloured *Mangilia*, few-ribbed, the number only extending to nine on the last whorl. Altogether it is seven-whorled, two of these being apical; the outer lip is thickened, no trace of sinus being perceptible; columella straight, canal very short.

Mangilia tetartemoris, sp. n. (Pl. II. fig. 24.)

M. testa pergracili, attenuato-fusiforimi, nitida, delicata, pallide straminea: anfractibus 7, quorum tres apicales, tertio perinflato, omnibus delicate cancellatis, cæteris ad medium angulatis, longitudinaliter sex-costatis, costis remotis, regularibus, æquidistantibus, superficie omni spiraliter arete liratula, ultimo anfractu bicarinato, carinis chordalibus; apertura angusta, oblonga, labro tenui, sinu lato, nequaquam profundo, canali paululum prolongato. Long. 8, lat. 2.50 mm.

Hab. Mekran Coast, off Astola Island, at 90 fathoms.

A remarkably graceful shell, conspicuous for its strong yet thread-like angled keels, one upon the upper whorls, two on the lower, while a rectangular appearance is obtained by the six longitudinal remote yet regular ribs on each whorl, these not being exactly continuous, as is the case with the sculpture of some *Mangiliae*; the apical whorls are beautifully cancellate, colour of the remainder pale ochreous or straw-colour, slightly intensified on the ribs. The spiral lines crossing the whorls are close and uniform. Sinus broad, but shallow. Mouth narrowly oblong, canal slightly prolonged.

An alliance with other handsome forms from the same region, e. g. *M. townsendi*, Sowb., *galigensis* and *o'maleyi*, Melv., is to be noticed. To the last of these it bears closest resemblance—indeed, at first I considered them identical; but the quadrate sculpture is peculiar to *M. tetartemoris*, which derives its specific name from this distinctive attribute.

*Pleurotomella rhytismcis**, sp. n. (Pl. II. fig. 25.)

P. testa perparva, alba, breviter fusiformi, compacta; anfractibus 6, quorum duo apicales bulbosi, læves, cæteris ad suturas multum

* *ρυτίς*, a wrinkle.

impressis, apud medium fortiter acute angulatis, undique costulis obliquis decoratis, spiraliter fortiter rudiliratis, ultimo anfractu etiam apud peripheriam fortiter angulato, et deinde ad basin liris spiralibus, numero novem, prædito; apertura ovata, labro extus ad medium angulato, columella fere recta.

Long. 3, lat. 1.50 mm.

Hab. Gulf of Oman, lat. 24° 58' N., long. 56° 51' E., 156 fathoms.

Allied to other *Pleurotomellæ* from the same locality—e. g. *P. nereidum*, *amphitrites*, *eulimenes*, &c.; but differing from all in its compact abbreviated-fusiform contour, wrinkled sculpture, and coarse median angulation. The spiral liræ, too, are coarse and pronounced, proportionately speaking.

Donovania tomlini, sp. n. (Pl. II. fig. 26.)

D. testa crassa, breviter et obtuse fusiformi, solidula, ochraceo-brunnea vel fere nigra; anfractibus 6-7, apice ipso perobtusos, crasso, interdum quasi-immerso, cæteris longitudinaliter crassicostratis, interstitiis intercostalibus lævissimis, apud suturas impressis, paulum ventricosus, ultimi costis anfractus numero ad 18, ad basin spiraliter crassiliratis; apertura anguste ovata, labro effuso, columella fere recta, canali brevissimo.

Long. 3, lat. 1 mm.

Hab. Persian Gulf, Henjam Island.

A good many specimens, collected together in 1906, showing the species to be gregarious, if local. Superficially it resembles *Cer. tubercularis*, Mont., or a *Bittium*, the colour varying from ochre-brown to almost black. Thick in substance, the apical whorls sometimes appearing almost immersed, causing the small longitudinal ribs of the third whorl to stand out, just as if placed at the summit of the shell, while in other examples the apex shows more distinctly and normally. The aperture is narrowly oval, outer lip effuse, columella almost straight, canal very short. With it occurred *Pyrgulina callista*, Melv., and a small *Triphora*.

This is the second *Donovania* recorded from these seas. The first was described under the name of *Lachesis bicolor*, Melv.* It gives me much pleasure to name it specifically after Mr. J. R. le Brockton Tomlin, who is devoting much time to the study of the smaller Mollusca.

Turris invicta, sp. n. (Pl. II. fig. 27.)

T. testa breviter conico-fusiformi, turrata; anfractibus ad 14,

* Mem. Manch. Soc. vol. xlii. part 2, no. 4 (1898). p. 14, pl. i. fig. 17.

quorum apicalis ipse bulbosus, pervitreus, duo hinc proximi vitrei, arcte longitudinaliter costulati, tertius unicarinatus, carina crenulata, cæteris apud suturas impressis, spiraliter tornatis, bicarinatis, carinis regulariter brunneo-maculatis et lineatis, interstitiis arcte spiraliter liratis, albis, ultimo anfractu multilirato, ad peripheriam fortiter bicarinato, carinis, præsertim superiore, regulariter brunneo-maculatis, liris omnibus simili modo ad basin brunneo-lineatis; apertura ovata, labro tenui, sinu conspicuo, columella recta, canali prolongato.

Long. 32, lat. 6 mm.

Hab. Persian Gulf.

Of this fine addition to the Pleurotomidæ I have only seen the type specimen, but am informed that others have been found. This is in very perfect condition, and belongs to the typical section of the genus, which has been compelled to have its well-known generic name *Pleurotoma*, Lam., 1799, altered, owing to one year's priority of *Turris* only. It perhaps most resembles the larger and more elongate *T. marmorata*, Lam., but the abbreviate form distinguishes it at a glance from both this and other allies. I am especially indebted to Mr. G. B. Sowerby for first calling my attention to this species.

Retusa turrigera, sp. n. (Pl. II. fig. 28.)

R. testa abbreviato-cylindrica, tenui, alba vel pallide straminea, spira gradata; anfractibus 4, quorum apicalis parvus mamillatus, subvitreus, cæteris turrigeris, lævibus, parum nitidis, ultimo interdum ad medium constrictulo, interdum normali; apertura ovata, subtus latiore, labro fere recto.

Long. 2·75, lat. 1·25 mm.

Hab. Persian Gulf, Mussandam.

A compact species, the whorls angularly turreted above, quite smooth, dull white or straw-coloured, the mouth widened basally, ovate; outer lip sometimes, with basal whorl, constricted in the centre, at other times quite normal and straight. We do not know a near ally, at all events in this fauna.

Lepton orientale, sp. n. (Pl. II. fig. 29.)

L. testa subæquilaterali, percompressa, explanata, tenui, alba, subpellucente, superficie delicate sed irregulariter concentricè striata, striis sericatulis, umbonibus prominulis, approximatis, margine dorsali antice paullum excavato, ventrali prope recto, pagina interna albo-lactea, cardine normali.

Alt. 3, diam. 4 mm.

Hab. Gulf of Oman, lat. 24° 58' N., long. 86° 54' E., 156 fathoms, shell-sand.

A few valves of a small *Lepton*, not unlike in form to the British *L. squamosum*, Mont.

EXPLANATION OF THE PLATES.

PLATE I.

- Fig. 1. *Cyclostrema tredecimlineatum*.
 Fig. 2. — (*Tubiola*) *nugatorium*.
 Fig. 3. *Solariella iridifulgens*.
 Fig. 4. *Monilea chiliarches*.
 Fig. 5. *Epitonium zatrephe*.
 Fig. 6. — *schepmani*.
 Fig. 7. *Crosseia alliciens*.
 Fig. 8. *Teinostoma emmeles*.
 Fig. 9. *Ethalia diotrephe*.
 Fig. 10. *Fluxina stenomphala*.
 Fig. 11. *Rissoa (Apicularia) townsendi*.
 Fig. 12. — (*Scrobs*) *elspethæ*.
 Fig. 13. — (—) *ictriella*.
 Fig. 14. *Obortio elongella*.
 Fig. 15. *Cerithium trigonostomum*.

PLATE II.

- Fig. 16. *Cerithiopsis eutreta*.
 Fig. 17. — *henjamensis*.
 Fig. 18. — (*Seila*) *ochrolivens*.
 Fig. 19. *Columbella (Seminella) salutaris*.
 Fig. 20. *Mitra (Pusia) geoffreyana*.
 Fig. 21. *Terebra remanalva*.
 Fig. 22. *Mangilia ichthys*.
 Fig. 23. — *querna*.
 Fig. 24. — *tetartemoris*.
 Fig. 25. *Pleurotomella rhytismeis*.
 Fig. 26. *Donovania tomlini*.
 Fig. 27. *Turris invieta*.
 Fig. 28. *Retusa turrigera*.
 Fig. 29. *Lepton orientale*.

II.—*Descriptions and Records of Bees.*—XXX.

By T. D. A. COCKERELL, University of Colorado.

THE present part is wholly devoted to Australian Prosopididæ. After studying a long series of species of *Meroglossa* and *Palæorhiza*, it becomes evident that the latter is at best a subgenus. An examination of the mouths brings out the remarkable fact that the males have pointed (dagger-like)